

SPECS Climate Prediction for Climate Services

F.J. Doblas-Reyes
ICREA, IC3 and BSC-CNS, Barcelona, Spain



- **Work on initialisation:** initial conditions for all components (including better ocean), better ensemble generation, etc. Link to observational and reanalysis efforts.
- **Model improvement:** leverage knowledge and resources from modelling at other time scales, drift reduction, better sea ice, projections of volcanic and anthropogenic aerosols, vegetation and land, etc. More efficient codes and adequate computing resources.
- **Calibration and combination:** empirical prediction (better use of current benchmarks), local knowledge.
- **Forecast quality assessment:** scores closer to the user, reliability as a main target, process-based verification.
- **More sensitivity to the users' needs:** user-relevant downscaling, better documentation (e.g. use the IPCC language), demonstration of value and outreach.

SPECS motivation

What: to produce quasi-operational and actionable local climate information

Why: need information with improved forecast quality, a focus on extreme climate events and enhanced communication and services for RCOFs, NHMSs and a wide range of public and private stakeholders

How: with a new generation of reliable European climate forecast systems, including initialised ESMs, efficient regionalisation tools and combination methods, and an enhanced dissemination and communication protocol

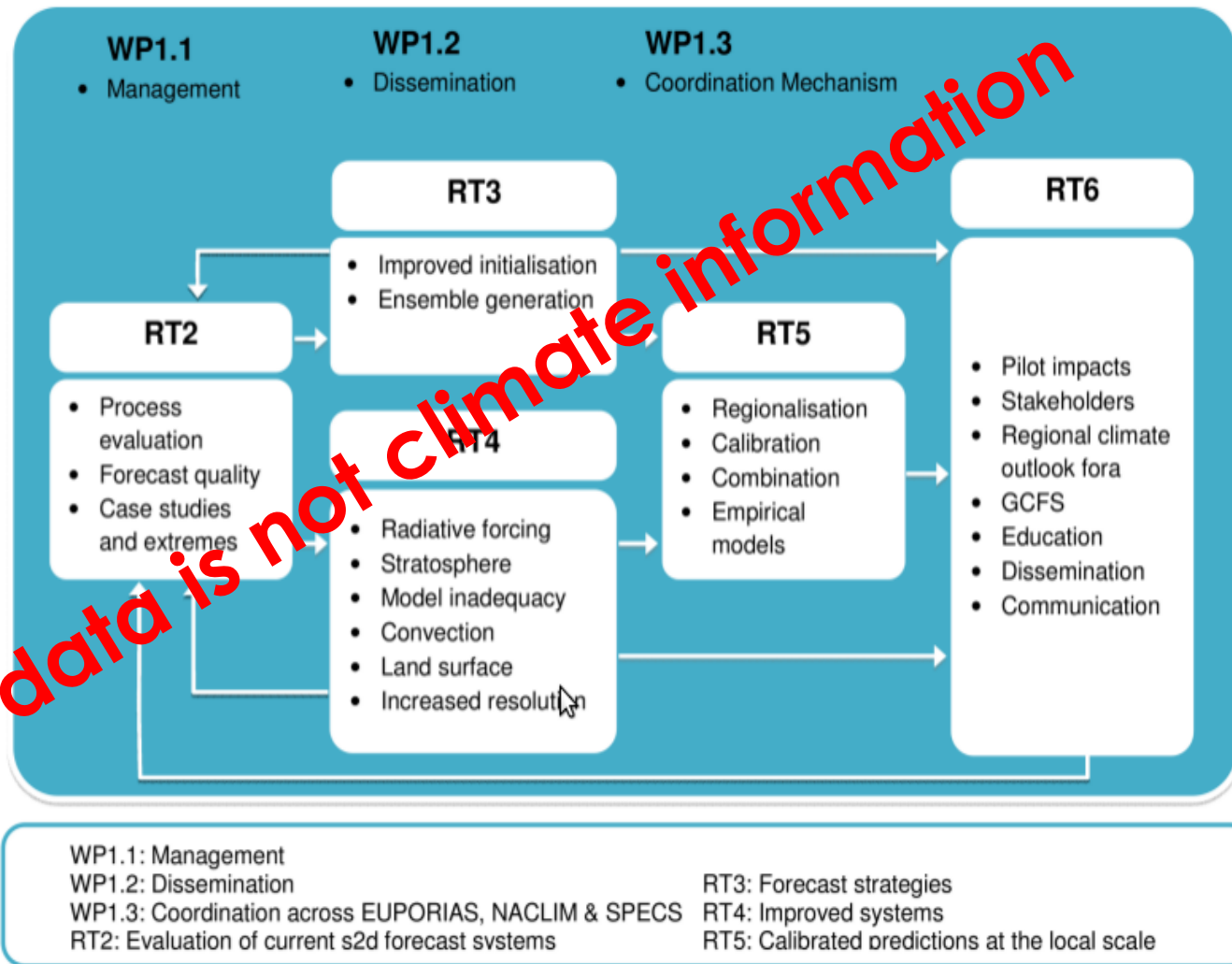
Where: over land, focus on Europe, Africa, South America

When: seasonal-to-decadal time scales over the longest possible observational period

<http://www.specs-fp7.eu>

- Links to EUPORIAS/NACLIM, but also IS-ENES2, PREFACE, EUCLEIA, CLIPC, ...

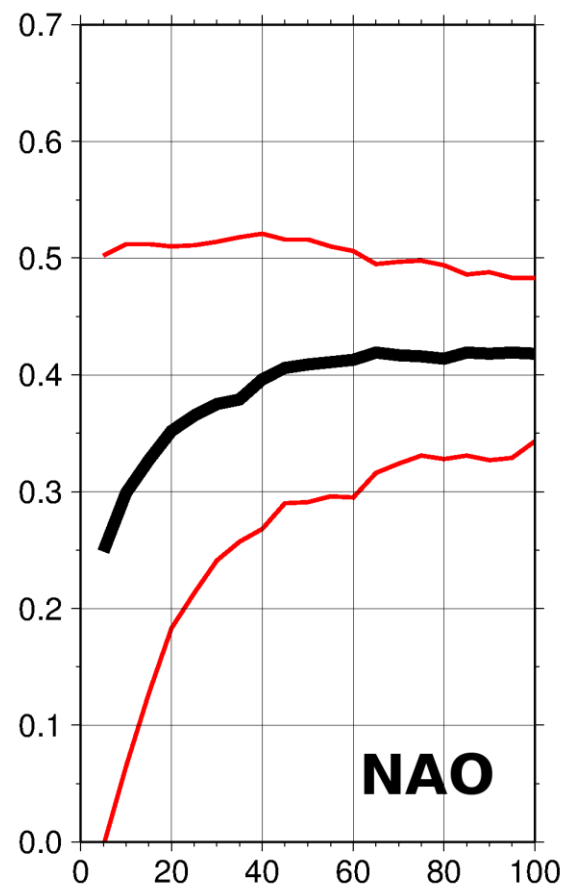
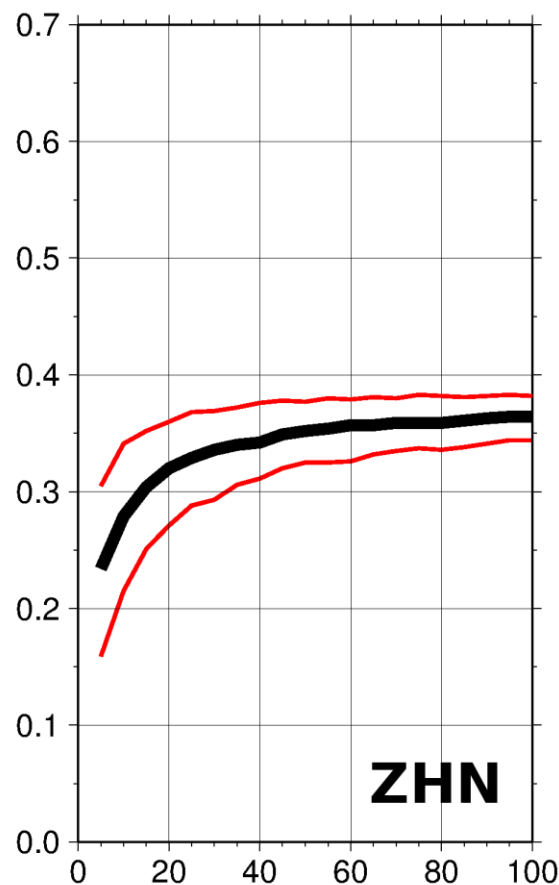
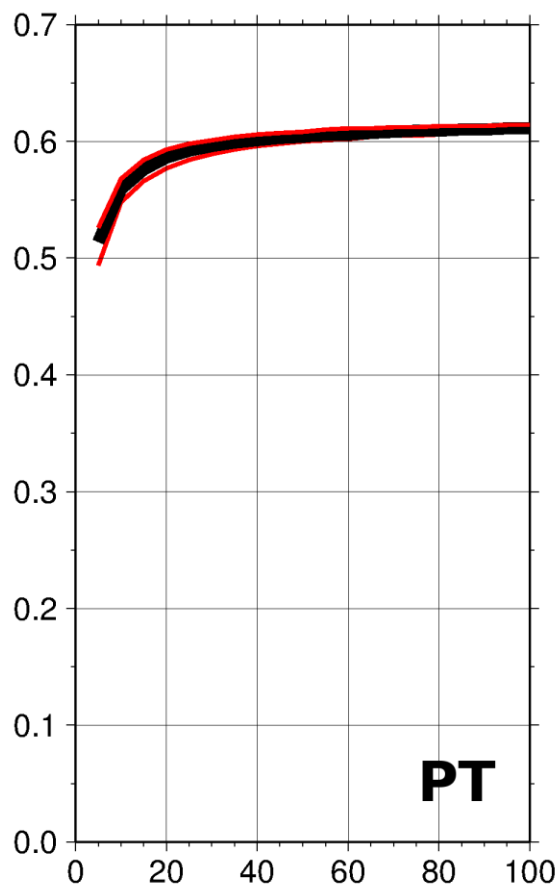
Forecast System	Project Partners
CNRM-CM5	CNRM, CERFACS
EC-Earth	KNMI, SMHI, IC3, ENEA
IFS/NEMO	ECMWF, UOXF
IPSL-CM5	CNRS
MPI-ESM	MPG, Uni-H
UM	UKMET



- Core (all forecast systems are expected to contribute to) and tier1.
- Not prescriptive, general purpose, linked to international activities (WGSIP, CMIP), definition to evolve during the lifetime of the project.
- Most experiments with two phases: development (quick to run and analyze) and production (redesign depending on development phase).
- Standard set up:
 - Seasonal: 10 members, May and November starts, 1981-2012, seven-month forecast length.
 - Decadal: 5 members, starts in 1960, 63, 65, 68, 70, 73, 75, 78, 80, 83, 85, 88, 90, 93, 95, 98, 2000, 03, 05, 08, 10, 13, five-year forecast length
- Focus on case studies and processes.
- Some of the experiments can be used, along with recent observations, for attribution studies.
- Common archiving and dissemination.

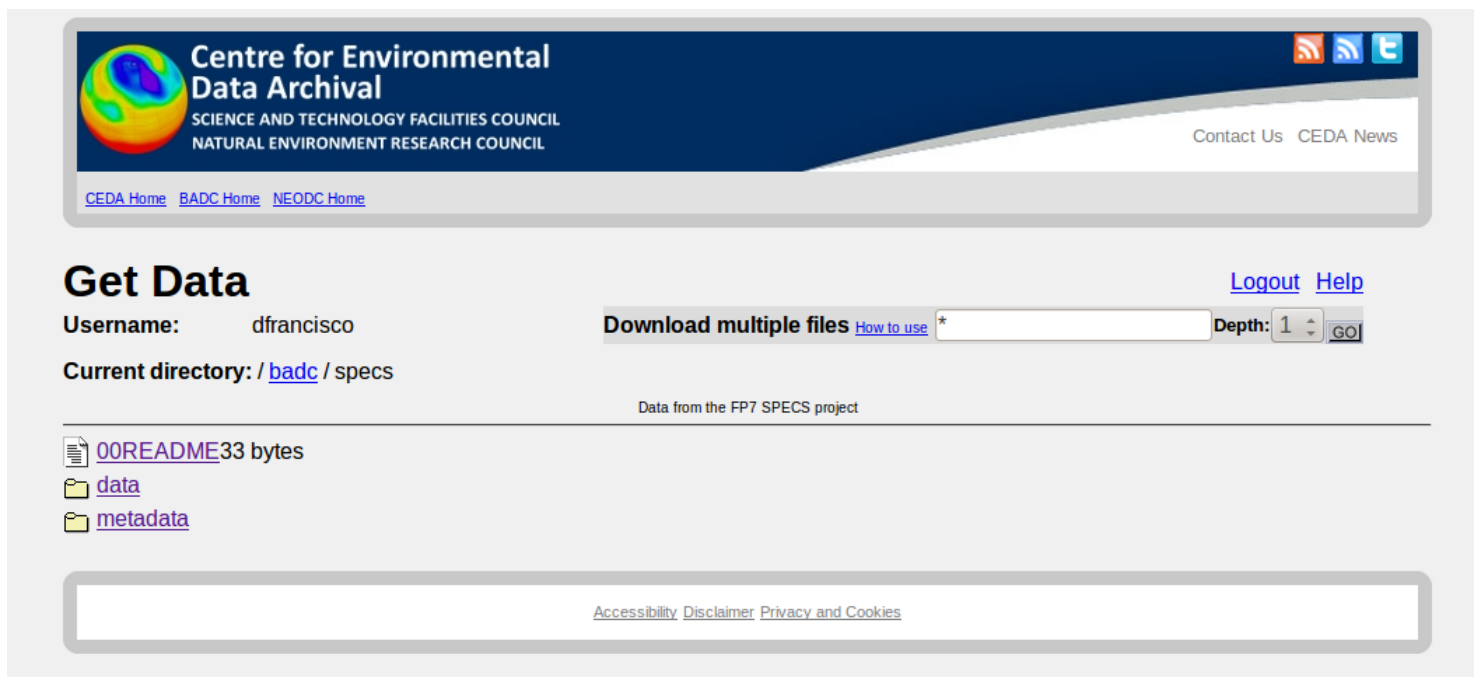
One result

CNRM-CM's correlation for ensemble-mean predictions of DJF (one-month lead time) tropical precipitation, Northern Hemisphere Z500 and NAO as a function of the ensemble size. Red lines for 90% confidence interval.



Data dissemination

Centralised data repository at BADC with files using a new convention building on both CMIP5 and CHFP, which will become the basis for CMIP6. Data published on the ESG after quality control reachable by other SPECS-related services (ECOMS UDG, Climate Explorer, etc). Multiple sensitivity experiments and NMME operational data already available.



The screenshot shows the CEDA website interface. At the top, there is a header with the CEDA logo, the text "Centre for Environmental Data Archival", and the affiliations "SCIENCE AND TECHNOLOGY FACILITIES COUNCIL" and "NATURAL ENVIRONMENT RESEARCH COUNCIL". There are also social media icons for RSS, Twitter, and Facebook, and links for "Contact Us" and "CEDA News". Below the header, there are links for "CEDA Home", "BADC Home", and "NEODC Home". The main section is titled "Get Data" and includes a "Logout" and "Help" link. Below this, there is a "Username:" field with the value "dfrancisco" and a "Download multiple files" button with a "How to use" link and an asterisk. To the right of the button is a "Depth:" field with a dropdown menu set to "1" and a "GO" button. Below the "Get Data" section, there is a "Current directory:" field with the value "/ badc / specs". Below this, there is a list of files and directories: "00README" (33 bytes), "data", and "metadata". At the bottom of the page, there is a footer with links for "Accessibility", "Disclaimer", "Privacy and Cookies", and a note "Data from the FP7 SPECS project".

GA 2014 verification demo

Aims and Agenda for the 2nd SPECS Verification Workshop [\[edit\]](#)

The aims of this short workshop are to:

- demonstrate new software that has been developed for verification;
- allow participants try this out on their own laptops;
- have a brief discussion about future needs and plans.

The planned agenda for the workshop is as follows:

Time Activity

11:00-11:20 Demo of UNEXE SpecsVerification software

11:20-11:40 Demo of IC3 S2dverification software

11:40-12:00 Demo of Meteo-Swiss verification software

12:00-12:45 Hands on session for participants to try out software

12:45-13:00 Brief discussion about future needs and plans

All these packages run in the freely available R language. See the R project site www.r-project.org to download R. Please also consider loading in your favourite forecast and observation data beforehand so that you can try out the verification on your own data.

More information about the new software is given below ...

- [SpecsVerification Demo talk-Media:Specsverification.pdf](#)
- [S2dverification Demo talk-Media:s2dverification.pdf](#)
- [Meteo-Swiss verification Demo talk-Media:veri.pdf](#)

Hands-on training workshop on “seasonal forecasting and downscaling” (Santander 8-12 September 2014)

The hands-on training workshop on "seasonal forecasting and downscaling" was organized in Santander (Spain), 8-12 September 2014, by SPECS (WP 5.2 and RT 6) with the collaboration of EUPORIAS.

Scope:

This workshop is designed specifically for the stakeholders and impacts communities of the ECOMS projects and the main goal is to train attendees in the use of different R-based tools to access, calibrate and downscale seasonal forecasting data. These tools are being developed as part of the SPECS and EUPORIAS activities, and include the ECOMS user data gateway (providing hindcast data from operational seasonal forecasting systems such as System4) and different R-packages for statistical downscaling. It will be also shown how to download and access the new SPECS seasonal forecasting simulations stored in BADC. In order to allow non-experienced R users to follow this workshop, it has been organized in two parts:

- 1) Atwo-days pre-workshop "an Introduction to R" (8-9 September) for trainees with no previous experience in R, and
- 2) a three-day workshop (10-12) including lectures on the fundamentals of bias correction and downscaling in the field of seasonal forecasting and hands-on training sessions using R.

This work will allow obtaining the regional and local seasonal predictions necessary for other tasks of the projects. Please note that the workshop is intended for the people who will actually work with the data.

Format and participation:

The workshop format will consist of lectures (30%) and hands-on training (70%) using the R software environment. The pre-workshop ("An introduction to R for climate data analysis") will only consist of hands-on training activities. The program will be shaped to enable group discussions and exchanges. The number of seats is limited to 30 and the hands-on sessions will be assisted by three trainers in order to guarantee convenient support.

The demos and hands-on sessions in this workshop are based on three R packages (accesible from GitHub):

The outcome of the workshop was presented at the NOAA virtual workshop on "Bias Corrections in Subseasonal to Interannual Predictions".

11:35 am – 12:05pm: SPECS-PREFACE workshop on initial shock, drift and systematic error (F. Doblas-Reyes; 25 minutes presentation, 5 minutes questions) - **Invited**

A screenshot of the NOAA Climate Program Office (CPO) website. The header features the NOAA logo and the text "CLIMATE PROGRAM OFFICE" with the tagline "Advancing scientific understanding of climate, improving society's ability to plan and respond". Below the header is a navigation bar with links: Home, About CPO, Climate Programs, Grants and Projects, Outreach and Education, Partnerships, Planning and Programming, and Contact Us. A search bar is located on the right. The main content area displays a link to "Virtual Workshop on Bias Corrections in Subseasonal to Interannual Predictions" and a section titled "Climate Prediction Task Force Virtual Workshop Bias Corrections in Subseasonal to Interannual Predictions" dated "30 September - 2 October 2014". A link to "Archive of presentations" is also visible. On the right, a sidebar titled "About the Climate Program Office" provides a brief description of the CPO's mission and research focus.

And inspired the WCRP's Working Group on Seasonal-to-Interannual Prediction "Long-Range Forecast Transient Intercomparison Project"

- For easy access to hindcasts and forecasts, **partners are encouraged to use NMME data instead of EUROSIP** (the case of decadal predictions is different). NMME also maintains a forecasters' forum: there is a **need for a storyline** in climate predictions (as already happens with weather forecasts).
- There is an increasing interest in **calibrated and combined predictions**, in some cases more than in producing downscaled, local forecasts. Calibration should be not just statistical, but also **process based**. Communicating the concepts of reliability and uncertainty goes hand in hand.
- The **connection between weather forecasting, climate prediction and climate change** is still far from solved. The concept of **environmental forecasting is just starting** to be known and the climate-change community is slow in partnering with the climate-prediction community.
- **General-purpose portals are hard to build** (e.g. climate4impact), and focuses on climate-change impact users, climate-prediction having a marginal role.
- Modellers and forecasters struggle to see the interest of directly **linking with users**. Groups working on bias correction, forecast communication and downscaling being the best bet to make that work: -> **co-production**.
- SPECS supports some **RCOFs**, but much more is needed.
- All the current initiatives need **appropriate coordination** to ensure making the most of the ecosystems of (partial) solutions proposed. Also, **s2d research is not finished (e.g. urban scale), funding to support the growing community**.
- The bridge between s2d prediction and **national/international policy** is not built (role of PROVIA?), where the "current climate laboratory" is not fully explored.

Grand Challenge on Regional Climate Information: What gaps in our scientific understanding and information, if addressed, would maximise the value content of regional climate information?

Steering group: Clare Goodess (WGRC), Francisco Doblas-Reyes (WGSIP), Lisa Goddard (CLIVAR), Bruce Hewitson (WGRC), Jan Polcher (GEWEX & WGRC), supported by Roberta Boscolo (WCRP)

WCRP Organization

